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IS 11694-1 (1986): single-lock automatic couplings for push
tows for inland navigation, Part 1 General requirements
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Indian Standard



SPECIFICATION FOR SINGLE-LOCK AUTOMATIC COUPLINGS FOR PUSH TOWS FOR INLAND NAVIGATION

PART 1 GENERAL REQUIREMENTS

1. Scope — Specifies the general requirements for single-lock automatic couplings for push tows intended for a bow-to-stern connection of inland vessels in push tows, navigating in waters with wave height of not more than 2 m.

1.1 This standard does not cover side couplings.

2. Definitions and Terms — For the purpose of this standard, the following definitions and terms shall apply.

2.1 Definitions

2.1.1 Automatic coupling — A coupling mechanism together with rest elements, ensuring:

- a) a quick connection of vessels,
- b) a reliable and safe bow-to-stern connection of vessels in a push tow travelling and manoeuvring in navigation conditions as stated in this standard, and
- c) a quick disconnection of the vessels.

2.1.2 Bow-to-stern connection — Connection of the vessels of a push tow in one of the following ways:

- a) bow of the pushboat to the stern of the non-powered vessel; and
- b) bow of the non-powered vessel to the stern of another non-powered vessel.

2.2 Terms

2.2.1 Coupling — The automatic single-lock coupling.

2.2.2 Coupling lock — The system of the coupling mechanism with gripping elements.

3. Types — The couplings shall be of the following two types:

3.1 Type A — The couplings for pushboats of up to and including 220 kW and for non-powered vessels with a carrying capacity of up to 1 000 t inclusive, operating in waterways with a wave height up to 1.2 m and a maximum wind speed of 12 m/s. The design stress on the coupling lock shall be not more than 200 kN. The maximum carrying capacity of a push tow shall be not more than 2 000 t.

3.2 Type B — The coupling for pushboats of over 220 kW up to 1 500 kW inclusive and for non-powered vessels with a carrying capacity of up to 4 000 t inclusive, operating in waterways with a wave height up to 2 m and a maximum wind speed of 19 m/s. The design stress on the coupling lock shall be not more than 2 000 kN. The maximum carrying capacity of push tow shall be not more than 19 000 t.

4. Material

4.1 Carbon steel shall be used as a primary material for the load-carrying parts, units and structures of couplings.

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4.2 The carbon steel for the parts, units and structures manufactured or installed by welding shall comply with the requirements of weldability.

5. Arrangement of Coupling

5.1 The bow coupling of pushboat/non-powered vessel shall consist of a coupling lock and rest element. The coupling lock shall be set in the centre plane of the vessel, and the rest elements located symmetrically to the coupling on either side (see Fig. 1).

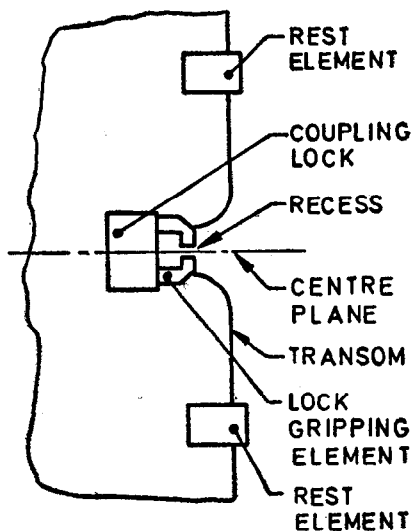


FIG. 1 BOW COUPLING OF THE PUSHBOAT/NON-POWERED VESSEL

5.2 The stern coupling of a non-powered vessel shall consist of a coupling beam and rest elements. The coupling beam shall be set in the centre plane of the vessel, and the rest elements located symmetrically to the coupling beam on either side (see Fig. 2).

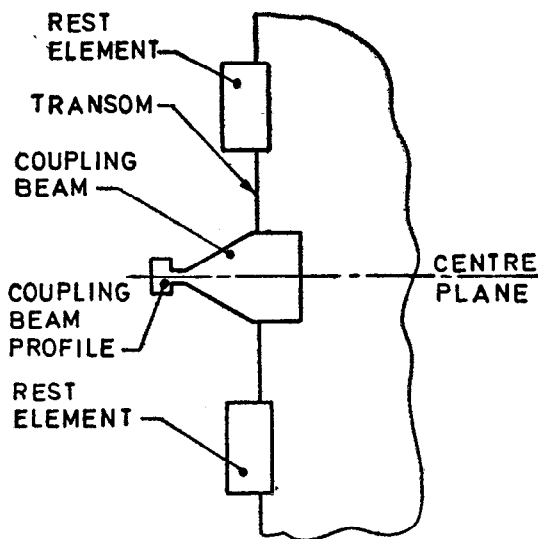


FIG. 2 STERN COUPLING OF THE NON-POWERED VESSEL

5.3 The width location of the rest elements shall ensure the possibility of coupling either a pushboat to a non-powered vessel or non-powered vessels to one another.

6. General Requirements

6.1 The connection of the lock gripping elements with the coupling beam and the contacts between the rest elements shall ensure coupling of the vessels under the following initial conditions:

- a) pushboat with tanks 10 percent full — non-powered vessel in full load,

- b) pushboat with complete tanks — non-powered vessel empty, and
- c) non-powered vessels between themselves with a draught difference up to 0.5 m inclusive.

6.2 The details, units and structures carrying load shall be checked by a strength calculation in conformity with rules of the statutory authorities.

6.3 Each newly manufactured coupling lock shall be bench-tested under a test load of not less than 1.5 times the design stress. The maximum stresses appearing in the main parts of a coupling lock under the effect of the test load shall not exceed 0.95 of the yield point of the material.

6.4 The final choice of the type of coupling and the design stress for the coupling lock shall be made based on a preliminary determination of the external forces which may appear during travel and manoeuvres of the push tow of the assigned tonnage.

6.5 The mechanism of coupling locks shall have devices to ensure the following operations during the operation of a push tow:

- a) disconnection of the lock under a load equal to the design stress,
- b) disconnection of the lock of a pushboat from the wheelhouse of the vessel and from the local post at the coupling lock itself, and
- c) disconnection of the lock of a non-powered vessel from the local post at the coupling lock itself.

6.6 The disconnection of the coupling lock shall be carried out for not more than 3 min.

6.7 The coupling structure shall not project beyond the sides of the vessel.

EXPLANATORY NOTE

This standard lays down the types, material and technical requirements of the single-lock automatic couplings intended for bow-to-stern connection of vessels in push tows. The waters where these couplings are being employed should not experience a wave height of more than 2 m. This part of the standard lays down the requirements which are common to Type A and Type B couplings. This standard is being issued in the following three parts:

Part 1 General requirements

Part 2 Type A couplings

Part 3 Type B couplings

Notwithstanding what is stated in this standard, the latest rules and requirement laid down by the Classification Societies and Statutory Authorities in all respects shall apply.

While preparing this standard considerable assistance has been derived from ISO 7545 - 1983 'Shipbuilding and marine structures — Inland navigation — Single-lock automatic coupling for push tows' issued by the International Organization for Standardization (ISO).